

A Systematic Survey on Deep Generative Models for Graph Generation

Year: 2020 | Citations: 174 | Authors: Xiaojie Guo, Liang Zhao

Abstract

Graphs are important data representations for describing objects and their relationships, which appear in a wide diversity of real-world scenarios. As one of a critical problem in this area, graph generation considers learning the distributions of given graphs and generating more novel graphs. Owing to their wide range of applications, generative models for graphs, which have a rich history, however, are traditionally hand-crafted and only capable of modeling a few statistical properties of graphs. Recent advances in deep generative models for graph generation is an important step towards improving the fidelity of generated graphs and paves the way for new kinds of applications. This article provides an extensive overview of the literature in the field of deep generative models for graph generation. First, the formal definition of deep generative models for the graph generation and the preliminary knowledge are provided. Second, taxonomies of deep generative models for both unconditional and conditional graph generation are proposed respectively; the existing works of each are compared and analyzed. After that, an overview of the evaluation metrics in this specific domain is provided. Finally, the applications that deep graph generation enables are summarized and five promising future research directions are highlighted.